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... annual plan
for consideration
under the State
Technical Services
Act of 1965

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State Technical Services

1968 Annual Plan

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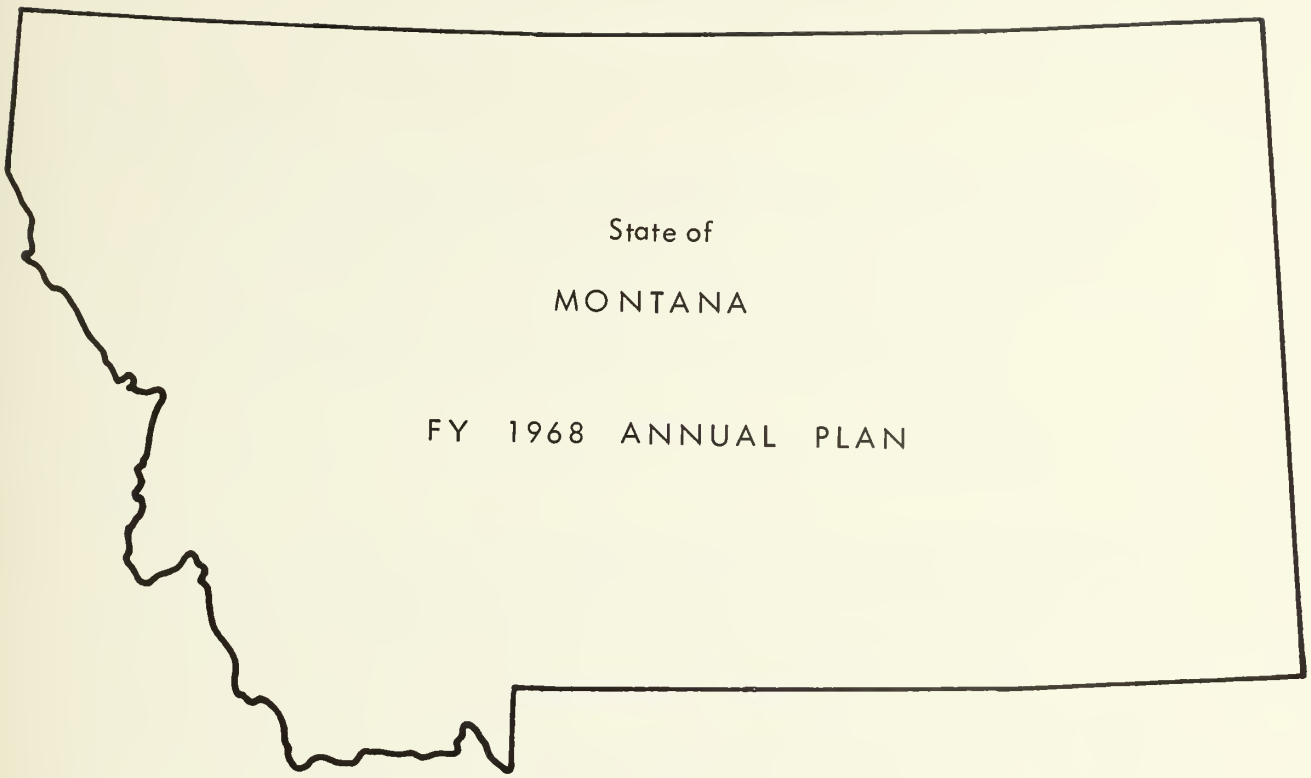

State of

MONTANA

FY 1968 ANNUAL PLAN

for consideration under the

STATE TECHNICAL SERVICES ACT OF 1965

submitted by the Designated Agency

Bureau of Business and Economic Research
School of Business Administration
University of Montana

Missoula
June, 1967

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GENERAL STATEMENT

State Program

The following State program is hereby submitted to the Director, Office of State Technical Services, for consideration for funding in FY 1968. The actual period for the proposed activities is July 1, 1967 to June 30, 1968.

Response

Response is made to Part 700 - General Regulations Governing Operation and Administration of State Technical Services Act of 1965 by indicating the section and sub-section which apply in each particular instance and by referral to a particular exhibit which contains supporting material pertinent to that section or sub-section.

Evaluation

Evaluation procedures have been included as one of the program elements.

Funding Limit

The maximum funding limit of federal matching funds for the State of Montana in FY 1968 is $55,500.00. The amount of the request for federal matching funds in the Program hereby submitted is $62,861.00 which includes administrative expenses in the amount of $3,572.00.

Priority

It is requested that the Office of State Technical Services consider the proposals in Group I as having equal merit, and, in the event that any program element in Group I does not seem fundable under the Act, that next consideration be given to program elements in Group II in the order presented until program elements in the amount of $55,500.00 have been accepted for funding. In the event that federal matching money in excess of $55,500.00 is available to Montana, then consideration should be given to those program elements (in the order presented) that follow the last proposal accepted under the original $55,500.00 grant. If less than $55,500.00 is available to Montana, please contact the Designated Agency before considering the order of priority.

Program Budget

Group I

Participating Institutions:	
Program Elements	$32,322.00
Administrative Expense (Designated Agency)	1,926.00
	$34,248.00
Office of State Technical Services:	
Program Elements	$31,875.00
Administrative Expense	1,925.00
	$33,800.00
Total Cost of Program in Group I	$68,048.00

Group II

Participating Institutions:	
Program Elements	$27,510.00
Administrative Expense (Designated Agency)	1,648.00
	$29,158.00
Office of State Technical Services:	
Program Elements	$27,414.00
Administrative Expense	1,647.00
	$29,061.00
Total Cost of Program in Group II	$58,219.00

RESPONSE TO PART 700 - GENERAL REGULATIONS GOVERNING OPERATION AND ADMINISTRATION OF STATE TECHNICAL SERVICES ACT OF 1965

700.6 (a) (1) (2)	Program Elements Project Sponsorship Purpose and Objectives Subject Matter, Audience, and Format Scheduling and Evaluation Relevancy to Five-Year Plan Detailed Budget
700.6 (a) (2)	Procedures have been outlined for adequate fiscal control, fund accounting and auditing, to assure proper disbursement for funds paid under the Act. (See Exhibit B).
700.6 (a) (3)	A statement has been made covering the specific responsibilities assigned to each participating institution in the state, and the method by which the participating institutions were selected for their respective responsibilities (See Exhibit C).
700.6 (b) (1)	All qualified institutions in the state (as defined under Section 700.10) have been invited to submit proposals for providing technical services under the Act (See Exhibit D).
700.6 (b) (2)	Montana is actively coordinating its program with neighboring states through the Regional Technical Services Council (a subcommittee of the Federation of Rocky Mountain States). Program brochures and other announcements are circulated among the designated agencies

	of these eight states. Members of the Council are also considering the feasibility of Special Merit Proposals for the Rocky Mountain States.
	Coordination of technical services in Montana was achieved by inviting all qualified institutions to participate with the University of Montana in the planning of programs authorized under the Act. The participating institutions to date are: the University of Montana, Montana State University, and the Montana College of Mineral Science and Technology. In addition, the Montana State Planning Board was consulted at the initial planning stage.
	Duplication of other technical services is avoided by the coordination of the efforts of the above named institutions by the Montana University Technical Services Council which presently consists of members from each of the participating institutions named above. Other members from qualified institutions may be added upon request and as approved by the Council (See Exhibit E).
700.6 (c) (1-7)	Governor's Certification (See Exhibit F)
700.6 (c) (3)	A statement, in agreement form, has been signed by the duly authorized representatives of the participating institutions and will insure that the ethics and conflict of interest provisions are implemented in the proposed programs (See Exhibit G).
700.6 (c) (4)	It has been determined that matching funds will be available from State or other non-Federal sources (See Exhibit G). Each program element identifies the sources of matching funds that apply in each instance (See Exhibit A).

Matching funds means funds that are provided to a qualified institution by the State or by other non-Federal sources and may include fees, contributions, donations, gifts of money, the fair market value of services of personnel, the fair market value for the use for real or personal property, special user charges and tuition fees received from persons and private profit or nonprofit firms or institutions. Matching funds may include non-Federal funds expended on existing technical services programs of the State constituting a part of the State's annual program as approved under the Act and the General Regulations.

700.6 (c) (5)

It has been determined that Montana's FY 1968 program does not provide a service which on the date of submission is economically and readily available in the State from private technical services, professional consultants or private institutions. This determination was made through consultation with the participating institutions, the Montana State Planning Board and the Montana Technical Services Advisory Council.

700.6 (c) (6)

No services have been planned that relate to a particular firm or company, public work or other capital project except insofar as the services are of general concern to the industry and commerce of the community, State or region. If any such services are planned they will be outlined in the program elements (See Exhibit A) and a statement will be made that describes such services and the basis for the determination that such services are of general concern to the industry and commerce of the community, State or region. (See Exhibit G).

700.6 (c) (7)	Provision has been made for making public all reports prepared in the course of furnishing technical services supported under the Act or for making them available at cost to any person on request. The reports will be made available through the Bureau of Business and Economic Research at the University of Montana or through the various Bureaus at the participating institutions (See Exhibits A and C).
700.7 (a) (1) (2) (3)	An advisory council has been appointed by the Governor of the State of Montana which represents broad community interests (See Exhibit H).
700.7 (b)	The advisory council has reviewed this annual technical services program, evaluated its relation to the purposes of the Act, and reported its finding, which included appropriate recommendations, to the Designated Agency. The receipt and expenditure of any special user charges or fees has been specifically reviewed by the advisory council.
700.7 (c)	A copy of the report submitted by the advisory council to the Designated Agency has been sent to the Governor of the State of Montana. The Governor will submit a copy of this report with such comment as is deemed appropriate to the Director with the submittal of the annual technical services program. (See supplemental letter sent to the Office of State Technical Services by the Governor).
700.15	Any modification or expansion of an existing program is explained in the individual program elements and such explanation outlines that portion of the old program which contained

technical services, as defined by the Act, and identifies the nature of the modification or expansion of the technical services as well as the portion for which Federal assistance is sought (See Exhibit A).

700.16 The State of Montana's FY 1968 program does not provide a service which is economically and readily available in the State from private sources nor does it duplicate any other program readily available in the State from Federal or State agencies, including publicly supported institutions of higher learning in the State (See Exhibit I)

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SUMMARY OF FISCAL 1968 ACTIVITIES

Group I

MSU:	PROJECT NUMBER [1]	PROJECT DIRECTOR	STS SUPPORT	TOTAL COST	NEW OR CONT.	TYPE OF PROG.[2]	INDUSTRY SERVED	SCHEDULED DATE
Digital Computer Conference on Civil Engineering	F8SN1	W.A. Hunt	$ 1,721	$ 3,443	N	E	General	Fall '67
Engineering Research and Development Report	F8SC2	C. Tange, Jr.	6,518	13,036	C	NL	General	Monthly
Water and Waste Water Treatment Workshop	F8SC3	R.L. Sanks	3,159	6,318	C	E	General	Summer '68
Civil Engineering & Engineering Mechanics Seminar	F8SC4	W.A. Hunt	1,909	3,818	C	E	General	Throughout academic year
U of M:								
Seminar on Drug Selection by Computer	F8MN1	R.J. Bennett	$ 1,843	$ 3,686	N	E	Pharmacy	Spring '68
Computer Technology Seminar	F8MN2	D.M. Edmonds	3,711	7,423	N	E	Finance & Retail Trade	Spring '68

U of M:	PROJECT NUMBER [1]	PROJECT DIRECTOR	STS SUPPORT	TOTAL COST	NEW OR CONT.	TYPE OF PROG.[2]	INDUSTRY SERVED	SCHEDULED DATE
Forest Thinning by Remote Ignition Demonstration	F8MN3	R.W. Steele	$ 1,107	$ 2,214	N	D	Lumber	Fall '67
Forest Genetic and Silviculture Workshop	F8MN4	G. Blake	1,047	2,095	N	D	Forestry	Winter '67
MT:								
Mining Field Visitation Program	F8TC1	W.M. Johns	10,860	22,164	C	FS	Mining	Continuous
			Group II					
MSU:								
Chemical Processing Field Service	F8SC5	F.P. McCandless	18,114	36,229	C	FS	Chemical Processing	Continuous
MT:								
A Directory of Montana Scientists and Engineers	F8TC2	H. Warren	9,300	18,695	C	R	General	Annual

[1] Project Identification: F 8 M N 4
Fiscal 1968
University of Montana
Montana State University
Montana Tech
New Program
Continuing Program
No. 4

[2] Type of Program: E Education, NL Newsletter, FS Field Service, D Demonstration, R Referral

EXHIBIT A

PROGRAM ELEMENTS

Group I

Digital Computer Conference on Civil Engineering
F8SN1 page 3

Engineering Research and Development Report
F8SC2 page 9

Water and Waste Water Treatment Workshop
F8SC3 page 13

Civil Engineering and Engineering Mechanics Seminar
F8SC4 page 19

Seminar on Drug Selection by Computer
F8MN1 page 23

Computer Technology Seminar
F8MN2 page 29

Forest Thinning by Remote Ignition Demonstration
F8MN3 page 35

Forest Genetic and Silviculture Workshop
F8MN4 page 39

Mining Field Visitation Program
F8TC1 page 43

DIGITAL COMPUTER CONFERENCE ON CIVIL ENGINEERING
F8-SN1

Project Sponsorship

Montana State University, Department of Civil Engineering and Engineering Mechanics; Project Director, William A. Hunt.

Purpose and Objectives

The use of digital computers in the field of civil engineering has enabled the civil engineer to effect a more creative solution to his problems by freeing him from the myriad of routine, tedious, and time-consuming calculations. The rapid advances in computer technology make it possible to solve a large number of routine problems in much less time than the civil engineer could 5 years ago; at the same time this tool allows him to do a much more complete analysis by eliminating the necessity of making simplifying assumptions in his solutions and by allowing him to investigate many alternative solutions to the same problem. Consequently, he is able to develop much better solutions for the problems presented to him.

The purpose of the proposed conference is to demonstrate how computers may be most effectively used in solving a wide variety of civil engineering problems and how to think of computer capabilities when formulating the solution or alternative solutions to problems from all areas of civil engineering. Such a conference will assist in developing confidence in computer solutions and thinking in terms of computer solutions.

Participants may find immediate assistance and application for information and techniques presented in the conference by using general programs currently available in structural analysis, water supply distribution system design, foundation investigations, and surveying. A secondary aim is to make them better acquainted with the facilities available within the state and closer to their offices, making it possible for them to get better service on their computing needs. It is also hoped that this will demonstrate that assistance in their computing and programming needs is available within the University system.

The long-range goals include establishment of a computer library of programs with solutions in a format accepted and specified by the practicing engineering firms in Montana, enlargement of the programs requiring special solutions to the problems confronting the participants, and the eventual organization of a central computing advisory group to assist the participants in formulating solutions to problems of interest to all the participants.

Subject Matter, Audience, and Format

Tentative plans for the conference are to conduct several sessions on applications of digital computers in the civil engineering profession. This will consist of a general session followed by a series of specialty sessions in the areas of hydraulic engineering, structural engineering, and soil mechanics and foundation engineering.

The first session of the conference will be a two-day meeting to familiarize practicing civil engineers with the operation and capabilities of digital computers

and to acquaint them with computer applications to a wide variety of problems encountered in their fields of interest. This is accomplished most effectively by instruction in the formulation of problems for computer solutions and practice in using the computer to solve engineering problems. C. L. Miller, head of the Civil Engineering Department at Massachusetts Institute of Technology, will be invited to keynote this meeting.

The specialty sessions will be devoted to computer applications in specialty areas within the civil engineering profession. Tentative plans are to hold a number of one-day follow-up sessions on structural theory and design, hydraulic and water resources engineering and soil mechanics and foundation engineering. These sessions will be devoted to discussions and practice in formulating problems for the computer and then using it to solve them.

Scheduling and Evaluation

The general seminar sessions will be held in Bozeman, in October or November 1967, and the specialty sessions will be held at two-week intervals following the general session. The location of the specialty sessions will be determined at a later date on the basis of demand.

Effectiveness of this conference will be evaluated by the use of a questionnaire designed to determine type and class of participants, participants' previous knowledge of computing methods, assessment of the conference on making them more aware and confident of computer use and potential in their organization, and suggestions for improving the climate for computer use by engineers in Montana.

Relevancy to Five-Year Plan

Engineering technology is one area given priority in the Five-Year Plan. Although this proposal is not directly related to the Soil Mechanics and Foundation Engineering Conference, it results from the interest stimulated by that conference. Any continuing program which fulfills industry's demands for greater sophistication in a particular discipline is definitely within the long-range goals of State Technical Services in Montana.

Detailed Budget

1. Expenditures

Salaries:	
Civil engineers ($50/day, 8 days, 2 engineers)	$ 800.00
Student assistant ($150/mo, 2 mo)	300.00
Clerical	200.00
Payroll benefits, 8%	104.00
Per diem:	
Seminar speaker ($100/ea, 2 speakers)	200.00
Travel:	
Seminar speaker ($275/ea, 2 speakers)	550.00
MSU staff members ($26.66/trip, 3 trips)	80.00
Reproduction costs:	
Prepare handouts and compile notes on conference, multigraph and bind	200.00
Computer charges	300.00
Supplies	100.00
	$2,834.00
Indirect cost, 43.37% of salaries & benefits	609.00
Total cost	$3,443.00

2. Sources of funds

Registration fees and ASCE contributions	$ 709.00
Participating institution:	
Professional salaries	300.00
Payroll expense	104.00
Indirect cost	609.00
	$1,722.00
Office of State Technical Services	1,721.00
Total funds provided	$3,443.00

ENGINEERING RESEARCH AND DEVELOPMENT REPORT
F8-SC2

Project Sponsorship

Montana State University; Project Director, Carl Tange, Jr.

Purpose and Objectives

Many projects and programs take place on the Montana State University campus every week which should be of interest to Montana businessmen. Each year a considerable amount of money is expended on research and development projects in the College of Engineering. The Electrical Engineering Department has been responsible for a large portion of this research activity but the Chemical, Civil, Hydraulic and Mechanical Engineering Departments are also developing important research functions. Many of these research activities and reports have both regional and national significance; yet, businessmen have not given these developments serious consideration because they are not aware of them. No one department has taken the initiative to publicize campus programs and to point out the potential industrial applications of the research. A primary objective of the Engineering Research and Development Report would be to provide Montana's businessmen with this information.

Subject Matter, Audience, and Format

Funds provided under the Fiscal 1967 State Technical Services program made it possible to publish the Engineering Research and Development Report. Although the activity is just getting underway, a monthly newsletter will be published and distributed to Montana businessmen. Included in the newsletter are lists and descriptions of new research and development projects, information relating to new products and processes developed within the laboratories, with particular emphasis on their industrial applications, and lists of featured speakers and any other developments in the engineering field which might be of interest to businessmen.

A list of approximately 2,500 businessmen has been compiled and the engineering supervisor will be responsible for maintaining a current mailing list.

Scheduling and Evaluation

With the possible exception of summer, 1967, the newsletter will be published each month. In addition, the proposal includes an annual report on engineering activities and research and development projects.

At the end of one year, each businessman on the mailing list will be surveyed to determine his interest in the publication. Businessmen will also be asked to evaluate the newsletter by indicating which items are of most interest and what additional information should be included. More effective

evaluation procedures will be possible at the end of two years. If the newsletter serves the intended purpose, then businessmen will, by that time, be willing to help support the program in terms of a subscription fee.

Relevancy to Five-Year Plan

In the past one of the major problems of disseminating technological information to industry has been that the educational institutions qualified to provide such assistance have been hampered by lack of funds and by the failure of some businessmen to recognize them as sources of information; library facilities are limited and few of them place any emphasis on materials for businessmen. Hopefully this newsletter will stimulate the interest of the businessmen so that the technology available at Montana State University and other educational institutions can be transferred to and used by business and industry.

Detailed Budget

1. Expenditures

Salaries:	
Engineering supervision (1 mo @ $1,250/mo)	$1,250.00
Project engineer (8 mo @ $600/mo)	4,800.00
Clerical (4 mo @ $350/mo)	1,400.00
Payroll benefits, 8%	596.00
Mailing expenses, including communications and miscellaneous supplies	700.00
Report preparation	800.00
	$9,546.00
Indirect cost, 43.37% of salaries & benefits	3,490.00
Total cost	$13,036.00

2. Sources of funds

Participating institution:	
Staff salaries	$1,632.00
Payroll expense	596.00
Indirect costs	3,490.00
Report preparation	800.00
	$6,518.00
Office of State Technical Services	6,518.00
Total funds provided	$13,036.00

WATER AND WASTE WATER TREATMENT WORKSHOP
F8-SC3

Project Sponsorship

Montana State University; Project Directors, Mr. C. W. Brinck, Dr. E. R. Dodge, and Dr. R. L. Sanks. The workshop will be conducted in cooperation with the Montana State Board of Health.

Purpose and Objectives

Adequate provision for safe water supplies for the municipalities and industries of Montana is essential to the health and safety of the people, and control and reduction of stream pollution is necessary not only for the residents of Montana but also for all communities which take their water supplies at downstream locations from rivers (such as the Missouri River) draining from Montana.

There are about 180 water treatment plants and about 125 sewage treatment plants in the state. They are managed by personnel with formal educations ranging from fifth grade to advanced college degrees. Except for a few days of attendance at annual workshops, very few have received any formal education whatever in water and waste water treatment.

There is continuing need for the education of water and waste water treatment plant personnel for several reasons including: the lack of formal education in this field, the complexity of the treatment tasks, the breadth and depth of knowledge

required to adequately manage a treatment plant, and the dependence upon the manager for the efficient functioning of the plant. In the past this need has been approached by the water workshop held annually for the last 33 years under the jurisdiction of Montana State University and the State Board of Health. In the past, instruction has been confined to a two and one-half day period. In 1967, a five-day workshop sponsored by State Technical Services will make possible a much more effective program. But full effectiveness can only be assured by continuing the annual workshop.

The contribution of federal funds will not only permit the continuation for one year of a five-day workshop, but will also make it possible to increase the level of sophistication. More complex techniques, which cannot be covered in a one-day workshop, can be presented, and highly qualified lecturers can be employed.

Subject Matter, Audience, and Format

Participants will receive instruction in mathematics, hydraulics, microbiology, and chemistry, with specific applications to the operation of waste treatment plants. The workshop will be open to operating and supervisory personnel of private treatment plants but operators, supervisors and engineers employed by municipal, county and state agencies will also participate.

On the basis of past experience, 65 persons are expected to attend the 1968 workshop and participants will be charged a $10.00 registration fee. The

budget requested is larger than 1967 to provide for out-of-state instructors. In order for the treatment plant personnel to reach and to maintain a level of competence commensurate with that of other states, it is essential to employ highly qualified experienced lecturers. The funds requested are adequate for travel, per diem, and compensation for four such instructors.

Scheduling and Evaluation

The workshop is scheduled for summer 1968 and the project directors will complete a report summarizing the following evaluations:

1. written examinations,
2. number of participants receiving promotions and other recognition of improved technical skill, and
3. questionnaires filled out by the participants.

Relevancy to Five-Year Plan

Since this program is vitally important to Montana, the project director made every effort to determine alternative sources of funds. At this time the only available source of matching funds is State Technical Services. Until such time as those agencies primarily concerned with air and stream pollution actively support this type of program, the Water and Waste Water Treatment Workshop will receive priority in the Five-Year Plan.

Detailed Budget

1. Expenditures

Separable costs:

Montana State Board of Health	
Professional salaries (30 man days for 5 supervisors)	$1,435.00
Payroll benefits, 7 1/2%	108.00
Indirect cost, 8% of salaries	123.00
	$1,666.00
Montana State University	
Professional salaries (Project director, 3 wks; assistant, 7 days)	1,370.00
Payroll benefits, 8%	110.00
Indirect cost, 43.37% of salaries & benefits	642.00
	$2,122.00

Joint costs:

Publicity, printing, etc.	530.00
Travel, per diem, and honorarium for four outside speakers	2,000.00
Total cost	$6,318.00

2. Sources of funds

Registration fees (65 x $10)	$ 650.00
Participating institutions:	
Montana State Board of Health	
100% of indirect costs	123.00
Professional salaries	645.00
Montana State University	
100% of indirect costs	642.00
Professional salaries	1,099.00
	$3,159.00
Office of State Technical Services	3,159.00
Total funds provided	$6,318.00

CIVIL ENGINEERING AND ENGINEERING MECHANICS SEMINAR
F8-SC4

Project Sponsorship

Montana State University, Department of Civil Engineering and Engineering Mechanics; Project Director, William A. Hunt.

Purpose and Objectives

Rapid change occurring in the fields of civil engineering and engineering mechanics has necessitated a continual updating of professional persons at all levels in these fields of engineering endeavor. In many areas of the United States this technical updating is a relatively minor consideration because of the great number of people interested in a particular field and the relatively short distances between these people. In Montana, however, the large distances between small numbers of people interested in a particular area tend to discourage seminars.

It is hoped that this seminar will help the practicing engineers in Montana keep abreast of the new techniques and processes for solving problems in the traditional areas of structures, hydraulics, earthwork and foundations, and transportation. In addition, the seminar will make engineers aware of the new and

challenging fields in environmental engineering, aerospace exploration, oceanography, and water resources development open to civil engineers.

Long-range goals include the organization of an advisory group composed of practicing engineers that would indicate the frequency and the topical areas for offering similar conferences.

Subject Matter, Audience, and Format

Funds provided by State Technical Services made it possible to bring six internationally recognized leaders in the fields of civil engineering and engineering mechanics to visit the campus during the 1966-67 academic year. This proposal will enable the Civil Engineering Department to continue this activity. The six speakers for the 1967-68 academic year will provide presentations in the fields of structural engineering, highway engineering, fluid mechanics and hydraulics, and hydrology.

In some cases a manuscript of the presentation will be distributed to the attendees and other interested persons in Montana to use as a library reference.

Scheduling and Evaluation

The proposed visits, which will be scheduled throughout the academic year, will be publicized through technical and public channels in order to assure maximum attendence at each seminar.

The effect of each speaker's program will be evaluated by a questionnaire designed to determine the interest and relevance of the topic to the attendee's field of interest.

Relevancy to Five-Year Plan

Engineering technology was one area given priority in the Five-Year Plan. As long as the evaluation results are as indicative of an effective program as those compiled for the Fiscal 1967 program, this conference will continue to receive priority.

Detailed Budget

1. Expenditures

Salaries:	
Professional (2 engineers @ $250/wk, 2 wks)	$1,000.00
Clerical	200.00
Payroll benefits, 8%	96.00
Per diem:	
Seminar speakers ($75/ea, 6 speakers)	450.00
Travel:	
Seminar speakers ($225/ea, 6 speakers)	1,350.00
Preparation of program report	40.00
Supplies	120.00
	$3,256.00
Indirect cost, 43.37% of salaries & benefits	562.00
Total cost	$3,818.00

2. Sources of funds

Participating institution:	
Professional salaries	$1,000.00
Payroll expense	96.00
Travel	251.00
Indirect cost	562.00
	$1,909.00
Office of State Technical Services	1,909.00
Total funds provided	$3,818.00

SEMINAR ON DRUG SELECTION BY COMPUTER
F8-MN1

Project Sponsorship

University of Montana School of Pharmacy; Project Director, Dr. Raymond J. Bennett.

Purpose and Objectives

Although specificity is a paramount goal in drug application, nearly all drugs influencing the mind and/or body have more than one effect. Current drug classification for reference purposes is an inconsistent procedure which assumes a single drug influence. Further, pharmacological descriptions of single compounds are not necessarily identical in alternative references. Therefore, comparisons involving drugs which have similar uses but different influences are very difficult. The increasing number of available drugs will eventually preclude any such comparisons unless new drug information and classification systems are developed.

The University of Montana Pharmacy School has developed a computer-based drug information and classification system. Approximately 200 drugs are included in the computer program which provides a rapid way to match specific drug

influences with desired functional changes. The system is not currently being used, because computer applications to drug selection have only recently been developed and because drug selection by computer request requires a general understanding of the capabilities and limitations of computer applications. Specifically, pharmacists must understand the language in which the request is made and be able to interpret the reply. This 3-day seminar would make such information available to the pharmacists within the State.

A primary objective of this seminar is to acquaint pharmacists and related personnel with the potential contributions of this technological development. Hopefully, those few participants who have available computer facilities will be stimulated to engage in further experimentation of drug selection and classification by computer.

In the long run this seminar may provide the initial stimulus for developing a computer service which would link the major Montana cities. Broad industry participation in such a computer service would, in turn, expand the number of drugs and clinical requirements included in the computer program.

Subject Matter, Audience, and Format

The seminar will accommodate approximately 60 pharmacists and related personnel with the staff members from the University of Montana Pharmacy School

and Computer Center and computer specialists providing the leadership and instruction.

Participants will have an opportunity to:

1. hear presentations of theoretical reports concerning the limitations and potential of drug selection by computers.

2. review a demonstration of a feasible computer program which permits matching sample drugs to clinical requirements.

3. participate in computer laboratory exercises relating to drug selection.

4. observe, by visual demonstration, the overall system in operation.

5. hear from industry sources, suggestions concerning alternative system designs and analysis of computer services.

Because most of Montana's retail pharmacies are relatively small, purchasing or leasing of computer facilities for the sole purpose of drug selection would not be feasible, even on a cost-sharing basis. Therefore, other potential applications of computer technology will be presented at the seminar.

Scheduling and Evaluation

To allow maximum time for refining the computer program and for preparing the visual aids, the seminar will be scheduled for the end of Fiscal 1968.

If this seminar encourages Montana pharmacists to conduct further experimentation with this drug information and classification system then it has been

effective. Both questionnaires and personal interviews will be used to measure the extent to which pharmacists would be willing to cooperate in establishing a small-scale computer network.

Relevancy to Five-Year Plan

In the Five-Year Plan reference is made to the growing retail trade and service industries and to the fact that State Technical Service activities have not been directed toward servicing the informational needs of these industries. This seminar represents one of the first attempts to provide information to a segment of the retail trade industry.

Detailed Budget

1. Expenditures

Salaries:	
Professional (2 professors, 6 days preparation each)	$ 600.00
Clerical (preparation of teaching aids, brochures, and hand outs)	450.00
Payroll benefits, 8%	84.00
Outside speakers (honorarium, per diem, travel, lodging, and meals for 6 guest lecturers)	1,038.00
Supplies	200.00
Rental, computer facilities and staff time	400.00
Preparation and publication of proceedings	300.00
	$3,072.00
Indirect cost, 20%	614.00
Total cost	$3,686.00

2. Sources of funds

Registration fees (60 x $20)	$1,200.00
Participating institution:	
Professional	300.00
Clerical	210.00
Payroll expense	42.00
Preparation of proceedings	91.00
	$1,843.00
Office of State Technical Services	1,843.00
Total funds provided	$3,686.00

COMPUTER TECHNOLOGY SEMINAR
F8-MN2

Project Sponsorship

University of Montana, Department of Mathematics, University Computer Center, and the Bureau of Business and Economic Research; Project Director, Dwight M. Edmonds.

Purpose and Objectives

Significant increases in employment occurred in retail trade and the finance and service industries in Montana between 1950 and 1960. Although these industries are important contributors to Montana's economy they have been given little assistance either in planning and development or in instruction in computer techniques which would enable them to operate more profitably. Yet, many technological applications exist which would improve both their operating efficiency and profitability. Most of the businesses in these industries are very small and their operators frequently have neither the time nor the specialization necessary to acquire technical information on their own. Generally owners are unaware of these technological developments or, if they are aware of them, they have little or no information concerning the sources of expertise.

An effective way of disseminating this information could be extremely helpful to Montana businessmen. Published information services describing computer

and mathematic applications to business have not been successful, primarily because the resources necessary to interpret and relate this information to problems facing the individual firm or industry have not been available. This seminar would make such information available to businessmen in the retail trade, finance, and service industries.

Subject Matter, Audience, and Format

The computer seminar will be devoted to three topics:

1. Applications of Computer Technology and Statistical Decision Making to Industry Problems. Participants will be separated into several small groups. Actual grouping will depend upon common technological problems, determined by information obtained from preregistration forms. Each group will have an opportunity to hear how problems common to that group have been more easily defined and solved more rapidly by use of statistical, mathematical, or computer technology.

2. System Analysis and Profit Relationships. Participants will have an opportunity to review potential changes in operating efficiency and profitability resulting from technological applications. Considerable attention will be given to the ways in which modern technology can be fused with existing record and operating systems. This session will follow the same grouping arrangement so that system design and profitability can be related to the specific applications discussed in an earlier session.

3. Feasibility of Technological Applications. All participants will be able to examine alternative proposals for financing and designing computer or statistical applications which fit the needs of individual firms. Representatives from industry and the local data processing centers will conduct this session. Several case analyses of adaptations to Montana firms will be presented.

Scheduling and Evaluation

The University of Montana Bureau of Business and Economic Research in cooperation with the Department of Mathematics and University Computer Center will conduct a one and one-half day seminar and demonstration in four Montana cities. One-half day will be devoted to each of the three topics. To allow sufficient time to develop the demonstrations and to promote the project the seminar will be scheduled toward the end of Fiscal 1968.

Certainly computer installations or statistical decision making will not be an immediate consequence of this seminar. Technological development involves three distinct phases. First, the potential user must be aware of his problems. Once the awareness exists the next likely step is to seek the advice and consultation of an expert in the field. Then, an expert designs a particular system which best solves the businessman's problem. Only after these three phases have been successfully completed will the individual businessman be in a position

to consider computer or statistical applications. This seminar will have made an important contribution to technological development within the state if it creates an awareness of existing technological problems and gives the businessman some idea of the sources of expertise.

The first of these seminars will be experimental; questionnaires and discussion periods will be used to determine the effectiveness of the seminar and the possible changes for the subsequent seminars. If the seminar series accomplishes the intended purpose participation in the last three seminars should exceed that of the first.

Participating faculty members will represent several of the educational institutions in Montana and participants will be requested to use these individuals as contact points for further technical assistance. Each of the faculty members will maintain a list of contacts and references made following the seminar series. Eventually this project may serve as a basis for a field service activity for the retail trade and the finance and service industries.

Relevancy to Five-Year Plan

Reference is made in the Five-Year Plan to the growing retail trade and service industries and to the fact that State Technical Service activities have not been directed toward servicing the informational needs of these industries. This seminar represents one major attempt to provide technological information to these industries.

Detailed Budget

1. Expenditures

Salaries:	
Professional ($50/day, 5 days preparation plus 6 conference days, 6 faculty members, i.e. 66 man days	$3,300.00
Clerical	825.00
Payroll benefits, 8%	330.00
Outside speakers (honorarium & per diem for 2 persons)	200.00
Publication and promotion	800.00
Travel (1500 mi @ 10¢/mi)	150.00
Per Diem (6 faculty members, 6 days @ $14/day)	504.00
Supplies	77.00
	$6,186.00
Indirect cost, 20%	1,237.00
Total cost	$7,423.00

2. Sources of funds

Registration fees (75 x $25)	$1,875.00
Participating institution:	
Professional	1,259.00
Clerical	413.00
Payroll expense	165.00
	$3,712.00
Office of State Technical Services	3,711.00
Total funds provided	$7,423.00

FOREST THINNING BY REMOTE IGNITION DEMONSTRATION
F8-MN3

Project Sponsorship

University of Montana School of Forestry; Project Director, Robert W. Steele.

Purpose and Objectives

In the northern Rocky Mountains, stands of young ponderosa pine often are growing poorly and slowly because they are too dense. Research has clearly demonstrated that thinning these dense stands greatly increases the growth rate of individual trees. Thinning is an accepted practice for dense stands of ponderosa pine, but the operation is very costly when done manually. As a result many young stands of ponderosa pine are not being thinned.

Funds provided under the Fiscal 1967 State Technical Services grant made it possible to demonstrate the application of remote ignition techniques to slash burning. This same pyrotechnique can be used for thinning timber stands. Application of this technique would result in better quality and faster growing timber stands. A primary purpose of this seminar is to demonstrate to forest managers and private land owners the feasibility of this technique.

Subject Matter, Audience, and Format

The proposed demonstration will feature thinning of a typical dense stand by remote ignition. A major portion of the project director's time will be spent in preparing the area prior to burning as well as measurements after the fire to demonstrate the effect. The demonstration will be conducted on private land and will be open to managers of private lumber companies and private land owners.

Scheduling and Evaluation

The demonstration will be conducted in the late summer or fall depending upon weather and fire conditions.

The effectiveness of this program can not be fully assessed until some time after the demonstration has been completed. If the program is effective, lumber companies and private land owners will begin thinning by remote ignition; however, it is unrealistic to assume that adoption of the new technique will occur immediately. In the interim, questionnaires and personal interviews will be used to determine the extent to which the attendees learned how to make the application and how many plan to apply this new method of thinning.

Relevancy to Five-Year Plan

This demonstration is relevant to two goals outlined in the Five-Year Plan. First, forest products is one of Montana's basic industries and any program which

advances the level of technology of this industry will make a long-run contribution to Montana's economy. Second, those continuing programs which exhibit increasing sophistication deserve priority both in terms of the goals of State Technical Services and those of economic growth.

Detailed Budget

1. Expenditures

Salaries:	
Professional (Project director, 2 1/2 wks)	$ 590.00
Graduate assistant (3 mo)	600.00
Payroll benefits, 8%	95.00
Supplies, including brochure	90.00
Publication	400.00
Travel	70.00
	$1,845.00
Indirect cost, 20%	369.00
Total cost	$2,214.00

2. Sources of funds

Registration fees (20 x $25)	$ 500.00
Participating institution:	
Professional salaries	259.00
Graduate assistant	300.00
Payroll expense	48.00
	$1,107.00
Office of State Technical Services	1,107.00
Total funds provided	$2,214.00

FOREST GENETIC AND SILVICULTURE WORKSHOP
F8-MN4

Project Sponsorship

University of Montana, School of Forestry; Project Director, George Blake.

Purpose and Objectives

In the Northern Rocky Mountain region the lumber industry has depended primarily on old-growth or virgin timber stands. The once extensive virgin stands are diminishing rapidly and in the future the industry must rely on stands of second growth. To meet the increasing demands for lumber the logged areas must be restocked with trees which are of equal or better quality than those on the original stand.

Many of the attributes of a "quality" stand such as disease and insect resistance, wood quality, fiber length, resin production and rate of growth are directly influenced by hereditary factors and by tree-improvement techniques. The objective of this workshop will be to provide the forest land manager with an understanding of modern genetics and tree-improvement techniques.

Subject Matter, Audience, and Format

A series of three-day workshops will be held at the School of Forestry during 1968, 1969, and 1970. The workshop will consist of two three-hour technical presentations followed by two one-hour discussion periods each day. The 1968 workshop will emphasize the technical applications of genetics to plant breeding. The subsequent workshops will be predicated upon the participant's understanding of these techniques and will emphasize the more sophisticated methods of tree improvement. Certain applications of these techniques to silvicultural problems will be demonstrated.

Topics to be considered during the first year include meosis and mitosis as related to gamete formation, evaluations of the variation in species, methods of breeding and progeny testing, genetic gain through selective breeding. These topics will be related to natural as well as artificial regeneration.

The workshop will be open to approximately 15 foresters from industry but several representatives from federal and state agencies may also attend.

Scheduling and Evaluation

The workshops will be conducted during the winter quarters, 1968, 1969, and 1970.

Although the number of attendees will be limited to 15, additional applications will be tabulated to determine the interest in the workshop. The attendees will complete questionnaires designed to measure the effectiveness of the workshop. They will also be asked to indicate whether or not they plan to participate in the follow-up workshops and to suggest an acceptable registration fee.

Relevancy to Five-Year Plan

As indicated in the Five-Year Plan, Montana has been dependent upon three basic industries; wood products is one of these industries. Technological change has not been a major problem facing this industry because of the vast natural forests. However, increasing reliance on secondary stands has created a new awareness of technological innovations. Educational programs such as this workshop will keep the wood products industry abreast of changing technology and thereby help to maintain its contribution to Montana's economy.

Detailed Budget

1. Expenditures

Salaries:	
Professional (1 professor, 1 mo)	$1,000.00
Clerical	200.00
Payroll benefits, 8%	96.00
Outside speakers:	
Travel, per diem, and honorarium (1 speaker)	200.00
Supplies (including brochure)	250.00
	$1,746.00
Indirect cost, 20%	349.00
Total cost	$2,095.00

2. Sources of funds

Registration fees (15 x $30)	$ 450.00
Participating institution:	
Professional salaries	450.00
Clerical	100.00
Payroll expense	48.00
	$1,048.00
Office of State Technical Services	1,047.00
Total funds provided	$2,095.00

MINING FIELD VISITATION PROGRAM
F8-TC1

Project Sponsorship

Montana Bureau of Mines and Geology; Project Director, Willis M. Johns; Field Agent, Kenneth Bondurant.

Purpose and Objectives

A large segment of the mining industry in Montana cannot afford scientific and engineering expertise, which, if available, would help in solving many of the problems encountered in the development and operation of a mining property. It would result in better economic development and would eventually provide additional state and federal revenue. The Montana Bureau of Mines and Geology is well aware of this need and has attempted to alleviate the situation; however, the Bureau's effort has been limited by lack of funds, time, and personnel. Before Fiscal 1967 the Bureau program provided visits to mining properties by Bureau personnel when field conditions permitted. At that time geological, mining, and engineering problems of the mine operator were mutually discussed and technical advice given. However, in the past only a two-week period could be devoted to this phase of the program, and within this time period only a small fraction of the active mines in the state could be visited.

Subject Matter, Audience, and Format

Funds provided under the Fiscal 1967 State Technical Services program made it possible to greatly expand the program. Another geological engineer was hired which will make it possible to visit all active mining properties within the state at least once a year. Six months or more of the geological engineer's time will be spent making mine visits, discussing and solving problems of small-mine operators, and conveying to small-mine operators by direct contact information on new innovations in machinery, equipment, and methods of mining. Thus, the results of research by the U.S. Bureau of Mines and private industry will be passed on to those who can make effective use of it--the miners and operators themselves. Incidental to this information dissemination activity will be data collecting from the mine owner and operator for publication in the annual Bureau Directory which lists the mining properties located within the state.

Scheduling and Evaluation

The geological engineer will be available throughout the year and all active mining properties within the state will be visited at least once a year. Office consultation will also be provided whenever requested.

Although the program has only been operative for a few months, the response thus far suggests that at least one case study will be available. In addition, the field agent will maintain a continuous record of mining properties visited, total time spent

with individual firms, the nature of the problems discussed, and those technological applications common to several firms. Evaluations of the effectiveness of the program will also be made by having a representative from the designated agency present at some of the visits.

Relevancy to Five-Year Plan

As indicated in the Five-Year Plan, Montana has been dependent upon three basic industries; mining is one of these industries. In response to technological change, employment in the mining industry has declined and many firms in this industry cannot afford the engineering and scientific expertise necessary to adapt to technological change. It is anticipated that the Visitation program will aid in increasing mineral production and in improving mining and exploratory operations over the next five years.

Detailed Budget

1. Expenditures

Salaries:	
Assistant geologist ($750/mo, 12 mo)	$9,000.00
Project geologist (1 mo/yr)	925.00
Supervisor (2 wk/yr)	520.00
Editor (2 wk/yr)	520.00
Payroll benefits, 8.4%	921.00
Per diem:	
Assistant geologist (22 days/mo, 6 mo @ $12/day)	1,584.00
Project geologist (22 days/yr, @ $12/day)	264.00
Supervisor (14 days/yr @ $12/day)	168.00
Travel:	
Assistant geologist (13,000 mi @ 10¢/mi)	1,300.00
Project geologist (2,200 mi @ 10¢/mi)	220.00
Supervisor (1,400 mi @ 10¢/mi)	140.00
Reproduction costs:	
Bruning and Xerox reproduction of mine maps, reports, etc.	300.00
Supplies	435.00
	$16,297.00
Indirect cost, 36%	5,867.00
Total cost	$22,164.00

2. Sources of funds

Participating institution:	
Salaries, project geologist, supervisor, and editor	$1,965.00
Payroll expense	921.00
Per diem, assistant geologist, project geologist, and supervisor	2,016.00
Supplies	435.00
Reproduction costs	100.00
Indirect cost	5,867.00
	$11,304.00
Office of State Technical Services	10,860.00
Total funds provided	$22,164.00

PROGRAM ELEMENTS (continued)

Group II

Chemical Processing Field Service
F8SC5 page 51

A Directory of Montana Scientists and Engineers
F8TC2 page 57

CHEMICAL PROCESSING FIELD SERVICE
F8-SC5

Project Sponsorship

Montana State University; Project Director, Dr. F. P. McCandless; Field Agents, Dr. Mark Hannah, Dr. F. P. McCandless, and Mr. Don Brelsford.

Purpose and Objectives

Generally speaking, Montana's chemical processing companies are small firms serving, in most cases, a local market. Many of these companies have the potential for a much higher profit margin, higher production rate, and some could be expanded into larger organizations serving a regional or national market. However, these companies are not utilizing the technical knowledge which is necessary to increase the efficiency of their operations. Most of these small companies cannot afford scientific and engineering expertise to help solve their processing problems.

The failure to utilize technological improvements is not limited to the small firms in Montana. Some of the larger processing plants do not use the latest advances in technology such as control and optimization techniques that have been made possible by the high speed digital and analog computers.

The College of Engineering is well aware of this technology gap, and can best disseminate information on the latest chemical engineering practices by

forming a technical services group, utilizing the staff of the Chemical Processes Laboratory of the College of Engineering.

Subject Matter, Audience, and Format

Although this program was initiated under the State Technical Services Fiscal 1967 Plan (Technical Services Group), limited funding and departmental reorganizations have necessitated limiting the scope of the activities. Rather than providing technical assistance for all engineering problems as under the Fiscal 1967 proposal, the field agents will confine their activities to the chemical processing and related engineering problems. Three staff members of the Chemical Processes Laboratory will be included in the technical services group. These chemical engineers have a broad background in different areas of chemical processing. In addition, consulting help can be obtained as required from other Montana State University faculty members.

This group will make itself available to any Montana firm requiring and wanting technical assistance in chemical processing. Members of the group whose background best fits the needs of the firm requesting help will meet with owners and/or management and make a complete survey of their operations to improve their total efficiency and production capability. The Montana Directory of Manufacturers will be used to seek out those companies that might be interested in the services of the group. The type of assistance given would typically

be: (1) recommend ways to cut manufacturing costs and improve efficiency using latest technology, (2) look for opportunities to introduce new equipment or processing control and new techniques to improve performance, (3) point out developments of new products or processes that could be adapted in their total operations for expansion and diversification, and (4) assist them on latest processes and techniques available for combating air and water pollution.

Scheduling and Evaluation

During the initial months the field agents will spend considerable time contacting industry representatives to develop an awareness of the program. The field agents will be available throughout the year and successful technological applications will be made available to those firms having similar problems. Actual plant visits and consultation are the only means known for effective transfer of technology as it is intended under this program.

As one means of evaluating this program, the field agents will maintain a continuous record of the firms visited, total time spent with each firm, the nature of the problems discussed, the level of technology transferred, and those technological applications common to several firms. Periodically this record will be compared with the policy statement submitted to the designated agency as part of this proposal. Hopefully, this record will also serve as a basis for eventual case studies.

Relevancy to Five-Year Plan

Most businesses in the state are very small and their operators frequently have neither the time nor the specialization necessary to acquire new technical information on their own. Both educational and field service activities are necessary to assure that all Montana businessmen obtain this technical information. The engineering information and technical assistance provided by this program can be disseminated most effectively by field services activities.

Detailed Budget

1. Expenditures

Salaries:	
Project supervisor ($1,250/mo, 10 mo)	$12,500.00
Project engineers ($1,000/mo, 6 mo)	6,000.00
Faculty consultants ($1,200/mo, 2 mo)	2,400.00
Clerical ($350/mo, 4 mo)	1,400.00
Payroll benefits, 8%	1,784.00
Travel (11,000 mi @ 10¢/mi)	1,100.00
Communications	100.00
Reproduction costs	500.00
	$25,784.00
Indirect cost, 43.37% of salaries & benefits	10,445.00
Total cost	$36,229.00

2. Sources of funds

Participating institution:	
Staff salaries	$5,386.00
Payroll expense	1,784.00
Reproduction costs	500.00
Indirect cost	10,445.00
	$18,115.00
Office of State Technical Services	18,114.00
Total funds provided	$36,229.00

A DIRECTORY OF MONTANA SCIENTISTS AND ENGINEERS
F8-TC2

Project Sponsorship

Montana College of Mineral Science and Technology; Project Director, Dr. Herbert Warren.

Purpose and Objectives

No central agency in Montana prepares and maintains a current listing of all the scientists and engineers in the state. A comprehensive directory of all the scientists and engineers in Montana should be available because companies in Montana frequently need qualified men with specific backgrounds and education on short notice. The proposed directory and file system will be invaluable to companies in locating the needed technical expertise, and the use of engineering and scientific expertise will enhance the growth potential of industry in Montana.

Subject Matter, Audience, and Format

Funds provided under the Fiscal 1967 State Technical Services program made it possible to begin this project. A file containing information such as the address, education, work experience, present employment, and consulting

availability is being compiled for each scientist and engineer. The information will be kept on file at the Montana College of Mineral Science and Technology. Duplicate file systems will be made available to the University of Montana and Montana State University.

The Directory will contain all the information from the individual file except that which is confidential. Engineers and scientists will be classified in the Directory according to specific fields of interest.

Information on individuals is being gathered by writing letters to all the organizations, colleges, state and federal agencies, and businesses which employ scientists and engineers. Letters will then be sent to each individual whose name is obtained from the first survey requesting the information previously outlined and the names of other scientists or engineers whose names may not have been obtained in the first survey. Each individual will be asked to notify the project director of any change in his address, job affiliation, or any other pertinent change, and the employers will be asked to notify the project director of personnel changes. Approximately 8,000 scientists and engineers reside in Montana. If an average of eighty names with each individual's personal information can be printed on a regular letter-size page, the Directory will contain about 100 pages.

Scheduling and Evaluation

The Directory will be published once a year for general distribution to business firms and will be up-dated for five years. The project director will devote three months to the project the first year, two months the second year, and one month of each succeeding year. It is proposed that 3,000 copies of the Directory be printed the first year. The number of Directories printed in subsequent years will depend upon the demand for Directories of each preceding year.

Since the Directory will be made available to all business firms within the state the first year, no attempt will be made to fully assess the effectiveness of the project during that time. The second issue of the Directory will be distributed to those firms who return the notification card which will be mailed out prior to distribution. Throughout the five-year period a record will be kept of requests for additional copies. At the end of the third year businessmen will be asked to evaluate the Directory in terms of their willingness to subscribe to subsequent issues of the Directory.

Relevancy to Five-Year Plan

Once interested in technological improvement, Montana's businessmen must be aware of the sources of technical assistance and information. As indicated in the Five-Year Plan, no central agency compiles or maintains a listing of the available expertise in Montana. The Directory is one source document which will increase the awareness of available expertise.

Detailed Budget

1. Expenditures

Salaries:	
Project director ($1,175/mo, 2 mo)	$2,350.00
Placement director ($1,287/mo, 2 mo)	2,574.00
Clerical (362.50/mo, 12 mo)	4,350.00
Payroll benefits, 8%	742.00
Lease of equipment	230.00
Supplies	1,000.00
Publication	2,500.00
	$13,746.00
Indirect cost, 36%	4,949.00
Total cost	$18,695.00

2. Sources of funds

Participating institution:	
Salaries	$2,574.00
Payroll expense	742.00
Lease of equipment	230.00
Supplies	900.00
Indirect cost	4,949.00
	$9,395.00
Office of State Technical Services	9,300.00
Total funds provided	$18,695.00

EXHIBIT B

STATEMENT OF ACCOUNTING PROCEDURES

The accounts of the University of Montana are maintained and its reports presented in accordance with the Standard Manual of Accounts for the University of Montana system and within the general framework advanced in "College and University Business Administration" Volume 1, published by the American Council on Education. Auxiliary enterprises are reported on a modified accrual basis. All other accounts are recorded on a cash basis.

The accounts of the University are classified into five balanced fund groups as follows:

1. Current funds
2. Loan funds
3. Endowment funds
4. Plant funds
5. Agency funds

The accounts as above maintained are audited annually by the State Examiner's Office under the supervision and control of the State Auditor. Reports of this audit are forwarded directly to the Office of the Governor, with copies to the State Board of Education, Ex-officio Board of Regents.

Cash is received and funds are disbursed in compliance with procedures recommended by the American Association of Certified Public Accountants. Internal control

is divided so that all employees act as checks against defalcation of funds.

Funds received from the Office of State Technical Services under the State Technical Services Act of 1965 will be deposited in a separate account within the University General Ledger. State matching funds will be earmarked as matching funds and transferred to this account. Other non-Federal matching funds will also be deposited in the account. Expenditures from the account will be recorded and classified in detail according to standard University accounting procedures described above.

C. L. Murphy, Controller
University of Montana
(The Designated Agency)

EXHIBIT C

1. SPECIFIC RESPONSIBILITIES OF PARTICIPATING INSTITUTIONS

Each participating institution submitting a proposal under the State Technical Services Act of 1965 (Public Law 89-182) shall be responsible to the Director of the Montana University Technical Services Council for the completion of the proposal, including: (1) a determination of the effectiveness of the services provided, (2) a certification of proper distribution of funds provided, and (3) a certification that reports prepared in the course of providing services under the Act have been made public through the facilities designated by the Council. (See Exhibit G).

2. METHODS FOR SELECTION OF PARTICIPATING INSTITUTIONS

Participating institutions were selected on the basis of their response to invitations for submission of proposals under the State Technical Services Act of 1965 (Public Law 89-182). The invitations were publicly announced and issued in writing to institutions in the state that seemed qualified under Section 700.10. (See Exhibit D).

EXHIBIT D

The letter shown on the next page was sent to all qualified institutions in the state, as shown below:

Montana State University, Bozeman

Montana College of Mineral Science and Technology, Butte

Eastern Montana College, Billings

Western Montana College, Dillon

Northern Montana College, Havre

Carroll College, Helena

Rocky Mountain College, Billings

College of Great Falls, Great Falls

UNIVERSITY OF MONTANA
MISSOULA 59801 PHONE 243-0211

Bureau of Business and Economic Research

November 24, 1965

(DIRECT INVITATION SENT TO QUALIFIED INSTITUTIONS)

Dear :

The Bureau of Business and Economic Research has recently been named by Governor Babcock as the designated agency to administer Montana's program under the State Technical Services Act of 1965 (Public Law 89-182, 89th Congress, S. 949).

Under the provisions of this act, all qualified institutions in a state may submit proposals for activities or programs to the designated agency and the advisory council. Qualified institution means "an institution of higher learning with a program leading to a degree in science, engineering, or business administration which is accredited by a nationally recognized accrediting agency or association."

If your institution is qualified under this act and if you are interested in participating in the program, will you please let me know? I should also appreciate knowing if you are not interested. Time is very short; the advisory council must consider all proposals for next year, or for the five-year program, by January 1 in order that they may be submitted to the Department of Commerce by January 15.

Sincerely yours,

Norman E. Taylor
Director

NET/mac

EXHIBIT E

MONTANA UNIVERSITY TECHNICAL SERVICES COUNCIL

Item 198-002. Establishment of the Montana University Technical Services Council.

THAT, The State Board of Education, ex officio Regents of the Montana University System, approve the establishing of the Montana University Technical Services Council, to implement the program of the State Technical Services Act of 1965 (P. L. 89-182). Its general purpose will be to encourage and develop economic growth throughout the State of Montana through the wider diffusion and more effective application of science and technology to commerce and industry. The program of the Council will be developed cooperatively by the University of Montana, Montana State University, and Montana College of Mineral Science and Technology. The Council headquarters will be located in the Bureau of Business and Economic Research at the University of Montana in Missoula. The policy of the Council will be to promote the economy of Montana and, to that end, it will review program proposals submitted to it, approving those it considers worthy.

a. Statement of Purpose and Policy

With the recognized potential for growth because of geographical location, natural resources, and general western environment, it is obvious that reasonable steps be taken to improve the economy and industrial development of Montana. A Technical Services Council is hereby organized for these purposes through cooperative effort of the University of Montana, Montana State University, and Montana College of Mineral Science and Technology.

b. Functions

The Montana University Technical Services Council shall carry on such activities as it deems consistent with the purposes and policies of the State Technical Services Act of 1965, Public Law 89-182, passed by the 89th Congress on September 14, 1965. The Council shall advise the designated agency (University of Montana) in the creation of the five-year plan and the annual technical services program as required under the State Technical Services Act. The Council shall evaluate proposals and make recommendations of specific projects for inclusion in the one-year programs. It shall serve as liaison between the three institutions and local, state, and federal government agencies, and advise the presidents of the cooperating institutions concerning its activities.

c. Organization

1. Director

To fulfill a requirement of the State Technical Services Act of 1965, the Governor of the State of Montana has named the University of Montana as the designated agency. That institution shall also serve as financial Agent to the Council. The President of the University of Montana has designated the Director of the Bureau of Business and Economic Research as the Director of the Montana University Technical Services Council. The Director

will function as staff executive officer to the Council in carrying out its activities and will be responsible to his President. The Director shall prepare such reports as may be required to satisfy the agencies involved in any particular program.

2. The Council

The Council initially shall consist of four members--one from each of the three units of the University System mentioned above, and the Director. The Director shall serve as secretary at meetings of the Council and shall vote only in the event of a tie. The program of the Council shall be to review the project proposals submitted by the three units of the University System named above, or by other agencies, and to recommend to the designated agency approval or rejection as suitable undertakings under the Act. The Council shall elect its own chairman, who shall serve one year. The chairmanship shall thereafter rotate among the above mentioned three units of the University System. The Council shall meet at least four times a year at locations specified by mutual agreement of its members. The Council may meet at any time at the request of the Director or two of the three member institutions. Minutes of all meetings shall be kept.

3. Advisory Council

The Council shall recommend to the Director names of outstanding individuals in education, government, industry and professional fields to serve on advisory boards as desired or required in connection with federal programs such as those of the State Technical Services Act.

EXHIBIT F

GOVERNOR'S CERTIFICATION

I certify that the Designated Agency, the Bureau of Business and Economic Research, University of Montana, has:

(a) invited all qualified institutions in the State to submit proposals for providing technical services under the Act;

(b) coordinated its programs with other States and with other publicly supported activities within the State, as appropriate;

(c) established adequate rules to insure that no officer or employee of the State, the designated agency, or any participating institution, shall receive compensation for technical services he performs, for which funds are provided under this Act, from sources other than his employer, and shall not otherwise maintain any private interest in conflict with his public responsibility;

(d) determined that matching funds will be available from State or other non-Federal sources;

(e) determined that such technical services program does not provide a service which on the date of such certification is economically and readily available in such State from private technical services, professional consultants, or private institutions;

(f) planned no services specially related to a particular firm or company, public work, or other capital project except insofar as the services are of general concern to the industry and commerce of the community, State, or region;

(g) provided for making public all reports prepared in the course of furnishing technical services supported under this Act or for making them available at cost to any person on request.

The Honorable Tim Babcock
Governor
State of Montana

EXHIBIT G

AGREEMENT

STATE TECHNICAL SERVICES ACT PROGRAM

KNOW ALL MEN BY THESE PRESENTS, that this agreement is made this 29th day of May, 19 67 between the BUREAU OF BUSINESS AND ECONOMIC RESEARCH OF THE SCHOOL OF BUSINESS ADMINISTRATION OF THE UNIVERSITY OF MONTANA, at Missoula, Montana (hereinafter called the "Designated Agency") and Montana State University and Montana College of Mineral Science and Technology, along with all those persons whose signatures are subscribed hereto on behalf of Montana State University and Montana College of Mineral Science and Technology (hereinafter collectively designated as "Recipients"); and that said Recipients hereby agree, covenant and undertake that in consideration for and as a condition to the extension to Recipients of Federal financial assistance for any program under the State Technical Services Act of 1965 (Public Law 89-182 - hereinafter referred to as the Act) Recipients will conduct such programs and disburse such funds in compliance with the Act, with part 700 - General Regulations Governing Operation and Administration of State Technical Services Act of 1965, with all Department of Commerce Regulations

under Title VI of the Civil Rights Act of 1964, with all regulations subsequently made and promulgated by appropriate authorities, and with the following terms and conditions hereinafter set forth, to wit:

Ethical Standards: That Recipients agree to assure that the highest ethical standards are employed by all persons responsible for the administration of, or in any way associated with, the administration or performance of the proposed program, and agree that no person associated in any way with such program shall receive compensation for technical services he performs, for which funds are provided under the Act, from sources other than his employer, nor otherwise maintain any private interest in conflict with his public responsibility or the purposes for which Federal financial assistance was given, nor comingle any Federal funds with matching funds unless accurate records are maintained which show the separate balance of such funds, nor comingle any Federal funds with any private funds which are not matching funds, nor contract with or pay matching or Federal funds to any private individual or business concern in which he has any interest which may in any way conflict with the best interests of the program, nor in any manner derive any income, profit, or gratuity from the conduct of or administration of the program in any way which is inconsistent with the best interests of the program and the beneficiaries thereof, and that there will be rendered no services specially related to a particular firm or

company, public work or other capital project except insofar as the services are of general concern to the industry and commerce of the community, state or region.

Matching funds: That Recipients will provide all matching funds at any time required to successfully complete the program and will be solely responsible for the disposition of repayment thereof and accounting therefore in a manner consistent with the approved program, the best of ethical conduct, and all laws and regulations pertinent thereto.

That Recipients will keep a detailed budget and accounts and maintain and make available for audit purposes supporting fiscal records and documentation including vouchers, payrolls, invoices, contracts, receipts, etc. as evidence of grant expenditures, and adequate records containing the following information for each grant: (1) the amount of the grant received, (2) a detailed breakdown showing the disposition of each grant, (3) the total cost of the related program, (4) the amount and nature of the cost of the program supplied by non-Federal sources, including identification of such other sources; and (5) such other records as may be prescribed by the Director.

Reports: That Recipients will forward to the Designated Agency upon expiration of the sixth and the twelfth month after the commencement of any program the budget, accounts and documentation hereinabove provided for, and that Recipients will immediately notify the Designated Agency of any loss, misplacement, misapplication or

misappropriation of Federal or matching funds or of any breach of contract, law or lawful regulation pertinent to the disposition of such funds or conduct or administration of any program under the Act.

WHEREFORE, the Recipients on this the 29th day of May, 19 67 have hereunto set their hands and seals on behalf of Montana State University, Montana College of Mineral Science & Technology, and University of Montana

First Recipient

Signature Roy E. Huffman

Name Roy E. Huffman

Title Vice President for Research

Address Montana State University

Second Recipient

Signature Edwin G. Koch

Name Edwin G. Koch

Title Director

Address Montana College of Mineral Science & Technology

Third Recipient

Signature _____

Name _____

Title _____

Address _____

Fourth Recipient

Signature _____

Name _____

Title _____

Address _____

Designated Agency

Signature Fred S. Honkala

Name Fred S. Honkala

Title Contracting Officer

EXHIBIT H

MONTANA TECHNICAL SERVICES ADVISORY COUNCIL

In compliance with the requirements set forth in the State Technical Services Act of 1965 (Public Law 89-182), the Governor of the State of Montana has appointed twelve individuals to serve as the Montana Technical Services Advisory Council.

The individuals were selected in a manner so as to provide representation of broad community and state interests. Manufacturing interests are represented by Mr. Cromwell, Mr. O'Connell and Mr. Schoknecht; general business and finance interests are represented by Mr. Haines and Mr. Matteucci; mining interests are represented by Mr. Shea and Mr. Lane; engineering interests are represented by Mr. Morrison and Mr. Walker; government interests are represented by Mr. Chapman; and labor interests are represented by Mr. Hammond.

The Council will assist the participating institutions in the evaluation of programs proposed under the Act. None of the members of the Council shall participate directly in the planning, administration or substantive conduct of the technical services program within the State of Montana. (Consult the 1967 Revised State of Montana Five-Year Plan for full biographical material on the Council members.)

EXHIBIT I

In accordance with Section 700.16 of the General Regulations (Vol. 31, Number 75, April 19, 1966):

I have examined all readily available Federal and State activities and programs, including those of publicly supported institutions of higher learning in the State of Montana and I find that the State Technical Services Programs submitted by the State of Montana for fiscal 1968 do not duplicate such activities and programs.

Norman E. Taylor

Norman E. Taylor
Director, State Technical Services in Montana